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statement that clover seed is a failure when the flowers are not visited by bees.

The Bluebird and Holly berries.—Mr. THOMAS MEEHAN observed that the Blue bird had this season stripped his Holly trees of their berries, though it had been supposed by all, he believed, that no birds ate them. Some of the trees were but a few feet from his library window, which gave him a good opportunity to note that it was this and not the Snow-bird. These birds remained with him all through the severe weather of December, not leaving till the January snows came. They fed also on the berries of the common red cedar. He believed in the case of this bird the migration south in the winter season was not with them a question of temperature, but one of food. At least they remained with him in his cedar woods till the berries were all gone.

Vitality of Seeds under Low Temperature.—Mr. THOMAS MEEHAN referred to the seeds of wheat, oats and Indian corn, which, after having been left by the *Polaris* in 1872, had been found in 1876 by the Nares exploring expedition, and which, though exposed to the severity of four arctic winters, had yet grown. The growing plants had recently been exhibited before an English scientific society, and surprise expressed, particularly that seed of the maize, a tropical plant, should have received no injury. Mr. Meehan said that though the facts may not have been placed on record, it was not unknown in America that seeds of tropical plants had a power of resisting low temperatures not possessed by the plants themselves. The common forms of *Ipomæa*, known as "morning glories," the "Balsams" (*Impatiens*), the common tomato, and others, came up in gardens from self-sown seeds; and indeed there were large numbers of tropical weeds, which the first frosts destroy, and yet the seedlings appear the next year in great numbers. He called attention to this arctic experience with seeds, however, chiefly to suggest what had often occurred to him, from such observations, that seeds may keep for an indefinite time in low temperatures, when under high ones they soon lose vitality. There is no reason that he knew of why seeds might not get into an iceberg—keeping fresh perhaps for centuries—and in this way some problems in the geographical distribution of plants be solved. He suggested trials by those who had the opportunity. The common silver maple (*Acer dasycarpum*) had seed which usually completely lost vitality in a couple of months from maturity. Experiments with these by those who had large ice-houses, could not fail of resulting in useful knowledge.

On Rocky Mountain Locusts.—Dr. LE CONTE exhibited some recently hatched Rocky Mountain locusts, commonly called grasshoppers, which had just been sent to him by Professor Henry, of the Smithsonian Institution, and read the following communica-

tion, including extracts from the letter which accompanied them, giving the statement of Mr. J. N. High, by whom the eggs were collected near Fort Kearney, Nebraska:—

“They are found in small cylindrical tubes about one-tenth of an inch in diameter and four or five inches below the surface. Freezing does not destroy the eggs, nor the young ’hopper. It is said they may be frozen solid in water, and when the ice is thawed they will still exhibit life. They are said always to move in one direction, eastward, and that the tendency of the young is instinctively to hop in that direction. When the wind is unfavorable, or from an easterly direction, they alight and remain on the ground until the wind changes.”

While these remarks are perhaps founded upon too limited observation, they at all events enable the members of the Academy to make the personal acquaintance of this formidable pest, and to hear a brief synopsis of the plans devised for its suppression.

It will of course be impossible within the few minutes available at this meeting to condense the voluminous literature on the Locust in this and other countries, but there are a few points to which I may call your attention with profit.

The injury inflicted by these insects had extended over so large a space and so long a time, that towards the end of October (25th and 26th), a conference of Governors of Missouri, Iowa, Kansas, Nebraska, Minnesota, and Dakota was held at Omaha. In this meeting they were assisted by the counsel of several eminent men of science, among whom were the State Entomologists of Missouri and Illinois, Professors Riley and Thomas.

Various methods of destroying the locust were suggested, in accordance with the experience gained in other countries, and from the study of other insects. But the efficacy of all these methods was clearly shown to depend upon principles not dissimilar to some of the propositions set forth by me in an address delivered at Portland, in August, 1873, and another at Detroit, in August, 1875, and these principles may be summed up as follows, and are applicable to all insect pests:—

First. Correct observations in regard to the history and habits of the noxious insect, including its range of distribution; the time of its appearance in its different stages of development; in various parts of its area of distribution, its habits in these different stages; so that the proper time for most efficient attack may be found.

Second. Careful study of the most effective means of destruction, whether by means of mechanical (rolling, crushing, etc.), chemical (poisons, etc.), purely industrial (human labor), or vital (encouragement of birds and other enemies of the noxious insect).

Third. The publication in a popular form of this calendar of growth and habits of each species, and the effect of the various modes of suppression which are found efficacious, and the distri-

bution to farmers within the infested district of this compendium of useful knowledge.

Fourth. The procuring by wise legislation enactments of combined effort on the part of the agriculturists of the afflicted region, under the directions contained in the publication suggested in section 3, based upon the careful observations required by sections 1 and 2. Such information as is required for this purpose cannot be obtained without the aid of the National Government, as I have said on former occasions; and the whole spirit of the record of the proceedings of the conference of Governors, which I have mentioned above, is that the Government should take hold of this subject with the earnestness which its importance demands. Many similar appeals had been made before, but never by so distinguished a body, representing the will of five populous States and one Territory, all of which had been greatly devastated by this single insect, and in which the channels of human immigration had been changed by its ravages.

Yet this application failed as all former ones had done; and to this day there is not in the possession of any farmer or any student of science the information necessary for the suppression of even a single insect pest, unless it has been laboriously acquired by sifting many volumes of difficult access or of large cost.

On Mineral Caoutchouc.—Mr. GALLOWAY C. MORRIS presented specimens of mineral caoutchouc from South Australia, and stated that the material had attracted his attention in the exhibit of the South Australian Department of the Centennial Exhibition. From the exhibitor, Mr. C. W. Stuart, he had obtained the specimens, and from him learned that the substance is found during the dry season in a small section of country of a swampy nature in the Coorong District. It occurs in sheets from the thickness of a sheet of paper to about five-eighths of an inch; and is being manufactured into a good article of illuminating oil.

The geological formation of the basin in which it is found is thus described:—The surface is sand, either white and barren or brown and loamy, with occasional ridges or distributions of limestone. Below that is segregated limestone, hard and approaching crystallization, the interstices filled with light brown tenacious clay, followed by compact light red sandstone of various thickness gradually fading in color and consistence until it touches the water and merges into quicksand. On the lowest flats, fissures occur in the limestone; the orifices are very small and irregular but reach to the underlying quicksand.

In connection with this mineral caoutchouc is found another material, a sample of which he also presented which goes under the local name, from the district in which it is found, of Coorongite. He was told that it is found over the same ground as the caoutchouc, but at a rather lower level. He had found this mate-